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Publication number: **0 285 409 B1**

(12)

## EUROPEAN PATENT SPECIFICATION

- (45) Date of publication of patent specification: 18.11.93 (51) Int. Cl.<sup>5</sup>: **A23K 1/18, A23K 1/10, B65B 25/06, B65B 55/18**
- (21) Application number: **88302871.4**
- (22) Date of filing: 30.03.88

(54) **Process of preparing canned meat and gravy pet food.**

(30) Priority: 31.03.87 US 33347

(43) Date of publication of application:  
05.10.88 Bulletin 88/40

(45) Publication of the grant of the patent:  
18.11.93 Bulletin 93/46

(84) Designated Contracting States:  
**BE DE FR GB NL**

(56) References cited:  
**AU-A- 495 306**  
**CA-A- 892 505**  
**US-A- 3 898 345**

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EP 0 285 409 B1

## Description

The invention relates to a process for preparing canned pet foods; particularly to meat and gravy pet foods which are highly palatable due to high meat and significant fat contents, yet have meaty pieces exhibiting high integrity and a gravy component which is flowable from the can and coats the meaty pieces to provide a high sheen with no significant visible fat in the gravy.

The preparation of meat and gravy pet foods provides a number of technical problems. Unless chunks of muscle meat are employed, there is a problem of properly binding the meaty component ingredients into cohesive pieces which retain their integrity during processing including retorting after canning. Moreover, the retorting process tends to render fat from the meaty pieces and leach it, along with gelable constituents, into the gravy which often becomes clouded with visible fat, fines and other particulates, and gels, preventing free flow of the food from the container. Additionally, when producing foods of this type on a commercial scale, continuous processing is often difficult due to variations in process control which adversely affect final product quality and appearance.

## Background Art

In US Patent 3,836,685, R. E. Schara *et al* explain some of the problems associated with the fat released during the preparation of meat-in-gravy products, such as meatballs-in-gravy, meat chunks in a sauce, and the like, for either animal or human consumption. They state that such products are generally packaged in raw or partially cooked form and then cooked to their end point and sterilized by the application of heat to the sealed package using a process commonly referred to as retorting. In such a process, the fat, whether inherently contained in the meat portion or present as added fats, melts by virtue of the high temperatures to which it is subjected. As a result, the fat migrates from the meat pieces to the gravy portion of the product. Upon returning the packaged product to ambient conditions for distribution to the consumer, the melted fat returns to its solid form resulting in the formation of a "fat-cap" at the top of the package.

This fat-cap, besides being unsightly and, therefore, detrimental to consumer appeal, hinders the pourability of the contents of the can, and in some cases the products must be spooned out. Even if the packaged product is to be heated by the ultimate consumer, thereby liquifying the fat, the fat will be in the gravy portion of the product as opposed to the meat pieces, resulting in a gravy of thicker viscosity than originally formulated and also meat pieces lacking the characteristic mouthfeel imparted by the fat. To correct this problem, Schara *et al* add lipophilic fillers to a ground meat-containing formulation employed to make meat balls or chunks. They indicate that neither farinaceous fillers, such as wheat flour or cereal, nor proteinaceous fillers, such as finely ground caseinate, were satisfactory. However, the employment of nutritionally inert fillers adds cost, provides no nutrition, and takes the place of flavorful materials. Moreover, these inert fillers do not solve an equally serious problem of gravy gelation with products of this type.

In US Patent 3,843,815, S. A. Reesman states that it is well known that the connective tissue of the principal muscles of meat used in making the meat pieces in products of the type mentioned above contains the protein collagen. Collagen on heating in the presence of moisture dissolves and yields gelatin. Thus, subjecting a packaged meat-in-gravy product to high temperatures results in a "cooking-out" of the collagen and its decedent gelatin. When the packaged product is returned to room temperature for distribution and use, the gelatin, according to its well-known properties, causes the gravy to gel and results in a final product which is not readily pourable but must be spooned out.

Reesman discloses that the addition of from about 0.5 to about 3.5 percent of a weak acid will correct this problem. However, this adds expense and acid pH values or flavors associated with certain weak acid ions, are not suitable for many food products. Moreover, this technique does not solve the problem of fat-cap formation.

In US Patent 3,881,031, M. Glicksman *et al* propose another solution to the problem of cooking out of protein with resultant gravy gelation. They disclose that the addition of certain anionic polymers, such as sodium carrageenate, xanthan gum, gum tragacanth, sodium alginate, gum karaya, and the like, permits a retorted meat and gravy product to remain pourable after cooking. The addition of these materials, however, adds cost without solving the problem of fat cap formation.

In an earlier disclosure, in US Patent 3,574,633, R. J. Flier suggests that a canned meat and gravy product be cooled as rapidly as possible to minimize fatting out of the fat content of the disclosed meat chunks.

US Patent 3,898,345 to D. Horrocks *et al* is directed to preparing meat-like chunks from textured vegetable proteins, e.g., spun fibers, which are capable of canning with a gravy. They disclose forming fiber

bundles and binding them into groups with a binding emulsion. The emulsion can contain flavorant such as liver, colors such as blood, fat, and other ingredients in addition to binders which can be of the heat settable type such as wheat gluten blood plasma, egg albumen, starches and cellulose ethers, or other materials such as gelatine. They state that if the product is to be canned and sterilized in a static retort, the product can be made with sufficient integrity to withstand cutting, mixing with other materials, and canning. The materials which help to achieve this toughness by cementing the whole into a coherent mass, such as carrageenan jelly or fat, are said to be leached out of the product during sterilization, leaving a fragile chunk with the easy collapse properties of stewed steak. These products are, however, complex and costly to form and there is no indication that the problems of free fat or gravy gelation are alleviated.

In US Patent 4,247,562, J. W. Bernotavitz describes a method for preparing a canned food product composed of a nutritionally fortified liquid gravy and blood-based, retort-stable, meat-like chunks for use with dry pet foods or to use alone. The chunks are composed mainly of blood and employ a gum to stabilize the blood-based chunks. The gravy has added fat, flavorings and thickeners. The product is disclosed as being retort stable, however, without the presence of high meat levels or fat contents reasonable for palatability or nutrition in the meat pieces, the disclosure is inapposite to the problems associated with meat ball and meat chunk in gravy products.

CA-A-892505 relates to a method of making a canned meat product in which meat and meat by-products, including liver are ground and blended with other ingredients including a binder. The mixture is then tempered to a low temperature and formed into shaped pieces which are cooked and then packaged with a gravy.

AU-A-495306 relates to a process of making an extruded simulated fat marbled meat product in which white and red meat portions are ground at in a partially thawed state, mixed with a binding agent such as wheat gluten, cooked, cut into chunks, packaged with a gravy and retorted.

US-A-3898345 relates to a process for preparing a meat-like food product having the appearance and chewing properties of natural muscle meat in which bundles of artificial protein fibers are impregnated with a heat coagulable binding agent such as gluten, albumen or starch, the binding agent including, if desired, dried blood plasma, whole blood and creamed liver as well as other ingredients.

There remains a present need for a canned meat and gravy pet food which is highly palatable due to high meat and significant fat contents, which has meaty pieces exhibiting high integrity and a gravy component which is flowable from the can and coats the meaty pieces to provide a high sheen with no significant fat in the gravy. Additionally, there is a need for a process for producing foods of this type on a commercial scale.

The present invention provides a process of preparing a canned pet food comprising preparing a slurry by grinding a mixture comprising liver and other meat and meat by-products and incorporating therein a binder, subjecting the slurry to agitation and cutting sufficient to produce a meat emulsion, forming said meat emulsion, heating the formed emulsion, feeding thus formed meaty pieces with a gravy into a can, and closing and retorting the can, characterized in that liver is provided in an amount from 15% to 40% by weight of the meaty pieces, the binder includes at least 3% soybean flour and at least 2% dried blood plasma by weight of the meaty pieces, the meaty pieces have a total fat content of at least 2% and a total meat content of at least 75%, and the forming step comprises forming the meat emulsion into a sheet, the sheet being cut into discrete meaty pieces after being heated to an internal temperature of at least 76.67 °C (170 °F).

In the drawings:

Figure 1 is a schematic process flow diagram; and

Figure 2 is a schematic view, in perspective, showing a preferred unit operation for heat setting a meaty emulsion into resilient meaty material which can be sliced and canned with a gravy component.

The invention provides a canned meat and gravy pet food which is highly palatable due to high meat and significant fat contents, wherein the meaty pieces exhibit high integrity and the gravy component is substantially free from visible fat and remains flowable from the can and coats the meaty pieces to provide a high sheen.

The pet food is a nutritionally-balanced, highly-palatable and visually-appealing canned pet food comprising: (a) meaty pieces having a fat content of greater than 2%, a content of at least 75% meat-derived ingredients, and sufficient soybean flour and blood plasma to provide resilience and bind the fat; in (b) a transparent, free-flowing gravy which is substantially free of visible fat.

In a preferred aspect, the meaty pieces have a fat content of from 2 to 16%, and comprise from 3 to 10% defatted soybean flour, from 2 to 12% dry blood plasma and at least 75% meat-derived ingredients including from 15 to 40% liver, wherein the combined weight of liver, soybean flour and dry blood plasma is at least 30% of the weight of the meaty pieces.

The process enables the preparation of a canned, nutritionally-balanced pet food comprising a major amount of resilient meaty pieces having a content of meat-derived ingredients of at least 75% and a fat content of from 2 to 16%, and a minor amount of a transparent free-flowing gravy which coats the meaty slices to provide a high sheen, and in its more preferred aspects the process comprises: (a) preparing a  
 5 slurry comprising from 3 to 10% soybean flour, from 2 to 12% dry blood plasma, from 15 to 40% liver, and other ingredients necessary to prepare a cohesive, resilient meaty portion which is capable, upon further processing, of high speed cutting into cleanly cut slices with a minimum of fines, the combined weight of soybean flour, dry blood plasma and liver comprising at least 30% of the weight of the slurry; (b) subjecting  
 10 the slurry to agitation and cutting sufficient to produce a fine emulsion having a density of greater than 881 kg per cubic meter (55 pounds per cubic foot); (c) forming a sheet of emulsion on a continuously moving band; (d) passing said band and the sheet of emulsion thereon through steam heating means for a time sufficient to heat the sheet to an internal temperature of at least 76.67°C (170°F), said steam heating means comprising at least two chambers supplied with steam, including a lower chamber positioned under  
 15 said band which directs steam onto the underside of said band, and an upper chamber positioned above said band with a source of steam located centrally within said upper chamber defined by walls confining the steam on all sides except for an open bottom which permits contact of steam with said sheet and narrow gaps between the sheet and entrance and exit end walls through which steam is permitted to exit, such that if the thickness of said sheet increases, the velocity of steam over said sheet also increases, thereby bringing more steam into direct contact with said sheet and increasing the heat supplied to said sheet; (e)  
 20 slitting the sheet along a plurality of lines parallel to its direction of movement to produce a plurality of meaty strips; (f) slicing the strips transversely of their long axes to produce thin meaty slices with a minimum of fines and broken or ragged pieces; (g) preparing said gravy by heating a mixture comprising thickener and water in amounts sufficient to provide, after retorting and cooling, a gravy which is free-flowing from a can and coats the meaty slices to provide a high sheen; (h) filling cans with said meaty  
 25 slices and gravy; and (i) retorting the cans.

Those skilled in the art recognize that nutrition is of paramount importance. It is important that each pet food be nutritionally complete. Where this is done, it is not necessary for the pet owner to balance the quantities of different foods. Thus, the nutritional intake of the pet is assured so long as it intakes a minimum amount of food. Nutritionally-balanced foods will contain protein, carbohydrates, fats, vitamins and  
 30 minerals in amounts established by feeding tests to be sufficient for proper growth and maintenance.

A preferred product of the invention will meet the nutritional requirements as set forth in Nutrient Requirement of Dogs, revised 1985, which is published by the U.S. National Research Council of the National Academy of Sciences.

The unique appearance and texture of the meaty pieces and gravy of the present invention is stable  
 35 through retorting to provide a canned pet food product. By the term "canned pet food" is meant any sealed, packaged pet food which has been subjected to retorting with steam at high temperature for preservation. It will thus be apparent to those skilled in the art that the term "can" in this context is broader than metal cans, and includes molded or unmolded containers of one or more polymeric or other packaging materials, as well as glass jars and the like.

The pet food product is unique in its properties for one which has a meat content of greater than 75%,  
 40 and more preferably 80 to 85%, in the meaty pieces. Included within the term meat are those meat-derived ingredients defined as "meat" and "meat by-products" as defined by the current Definitions of Feed Ingredients published by the Association of American Feed Control Officials, Incorporated. As defined, the term "meat" includes not only the flesh of cattle, swine, sheep and goats, but also other mammals, poultry  
 45 and fish. The term "meat by-products" is defined to include non-rendered parts of the carcass of slaughtered animals, poultry and the like. Preferred meaty materials include beef and pork liver, beef, whole chicken, chicken parts, beef and pork lungs, beef and pork spleen, turkey and other meat and meat by-products.

The overall combination of meats affects product texture, integrity and flavor. It has been determined  
 50 that liver is an important ingredient in terms of texture due to its ability to form a cohesive, heat-set meaty material which resists leaching of fat and gelable protein into the gravy when used at a level of at least 10% by weight of the meaty pieces along with soybean flour and blood plasma. Levels of liver above 40% on this same basis are, however, less desirable because they tend to depress overall palatability.

The meat-derived ingredients are preferably ground prior to mixing with dry and liquid ingredients as  
 55 indicated at grinder 10 in Figure 1. At this stage, the meat-derived ingredients which can be supplied in frozen form are finely ground, preferably at near freezing temperatures. Fine grinding at this stage, e.g., through a 0.32 to 0.64 cm (1/8 to 1/4 inch) plate, improves mixing with dry ingredients and subsequent emulsification.

The ground meat-derived ingredients are fed to a mixer, such as 12 in Figure 1, where other ingredients of the meaty pieces are added and mixed to form a slurry. The high meat content of the pieces permits the addition of only up to about 25% by weight of other materials which will, of necessity, include dry binding ingredients and water sufficient to hydrate these binding ingredients if the moisture content of the meat-derived ingredients is not adequate.

It has been found that defatted soybean flour and dry blood plasma are effective in combination with liver in the formula, to prevent leaching of fat and gelable proteins into the gravy during retorting. Preferred formulations will contain from 3 to 10% soybean flour and from 2 to 12% dry blood plasma, in combination with at least 15%, more preferably at least 20%, liver. Desirably, the combined weight of these three binding materials will be at least 25%, preferably at least 30%, and most preferably from 35 to 50%, based on the weight of the meaty pieces. It is an advantage of the present invention that meaty pieces having the desired properties can be formed without the use of farinaceous ingredients, polysaccharide gum binders or inert fillers, and preferably the meaty pieces are substantially, if not completely, free of such.

It is another advantage of the present invention that up to about 8% free fat, such as choice white grease, tallow or lard, can be added in addition to the natural fat content of the meat for nutritional or palatability improvement without permitting substantial free fat to be visible in the gravy after retorting. The U.S. National Research Council recommends a fat content of at least 5% on a dry basis. Thus, for the high moisture product of this invention, a total fat content of the meaty pieces should be at least about 2% and will typically be up to about 16%, based on the weight of the pieces. A more preferred range is from about 6 to about 12% fat. If free fat is added, it is preferably heated sufficiently to liquefy it prior to addition.

In addition to the other ingredients, various minor ingredients such as nutritional supplements, coloring agents, antioxidants, and the like, will be added and mixed with the other ingredients sufficiently to provide a uniform slurry, say on the order of from 5 to 20 minutes. The moisture content of the slurry will typically be from 55 to 65%, preferably from 58 to 62% by weight, and will have a density of about 1057 kg per cubic meter (about 66 pounds per cubic foot).

The slurry, while being uniform, finely-ground and suitable for the preparation of pet foods other than one which must form well-defined, sliced pieces that must also survive retorting without loss of significant fat or gelable protein to the gravy, must be subjected to further agitation and cutting to form an emulsion. The slurry is therefore pumped from mixer 12 to emulsifier 14, still at a temperature just below about freezing. In one representative type of emulsifier, the slurry is advanced by a screw conveyor and forced through a series of knives and cutting plates. The emulsifier imparts significant mechanical work to the slurry, raising its temperature by, for example, as much as 13.89 °C (25 °F), typically about 8.33 °C (15 °F), by the time it exits the emulsifier, preferably as a fine creamy emulsion. The emulsion should have a density above 881 kg per cubic meter (55 pounds per cubic foot) preferably above 961 kg per cubic meter (60 pounds per cubic foot) or unsightly pieces, ragged cutting, broken pieces, and excess fines may result. More preferred densities range from about 977 to 1057 kg per cubic meter (about 61 to 66 pounds per cubic foot).

The emulsion is then formed into a sheet of emulsion and heated to an internal temperature of at least 76.67 °C (170 °F) to assure sufficient heat setting of the formulation to prevent significant fat or gelable protein to be leached during retorting and to enable slicing to obtain clean cut corners with a minimum of fines and broken pieces. The exact temperature may vary and will typically be within the range of from 77.78 ° to about 87.78 °C (from 172 ° to about 190 °F), preferably about 82.22 °C (180 °F) and above.

The exact means for shaping the sheet of meaty material and heating are not critical, but these operations should be conducted so that the final product is of highly uniform appearance and integrity. Figure 1 shows the emulsion being held in a tank 16 prior to being forced through a former 18 onto continuous metal band 20 supported and driven in the direction of the arrow by drums 22 and 24. The former 18 can have a plurality of die openings to form a plurality of narrow-sheets, i.e., strips, of emulsion on the band or can have one continuous die opening which extends essentially the entire width of the band to form an accordingly wide sheet. Where the die opening is of the wider variety, the die lands at the ends of the die for forming the sheet edges are desirably configured, such as by widening the gap between front and back forming die lands, to obtain as nearly square as possible ends on the sheet. The thickness of the sheet should be controlled as nearly as possible to obtain a sheet of uniform thickness, say from 8 to 12 millimeters, preferably from about 8.5 to about 10 millimeters prior to heating. Careful control of sheet thickness will affect not only the size and uniformity of the final meaty pieces, but also the ability to achieve uniform heating, with its important attendant results, on a continuous basis.

While heating means such as microwave and radiant ovens can be employed, it has been determined that steam heating, especially when conducted in the manner schematically shown in Figure 2, offers significant advantages when operating on a continuous basis.

Some variation in the thickness of the sheet is inevitable despite the fact that precautions are taken, and any significant increase in sheet thickness can cause under cooking of the sheet with its attendant problems of poor cutting, high percentages of fines and broken pieces, and leaching of substantial fat and gelable protein into the gravy during retorting. It has been found, however, that steam heating in the manner illustrated in Figure 2 mitigates the problems associated with sheet thickness variation to some extent.

The band 20 carrying the sheet of emulsion 26, shown in Figure 2, is preferably passed through the steam heating means, shown generally as 30, for a time sufficient to heat the sheet to an internal temperature of at least 76.67°C (170°F). The steam heating means 30 comprises at least two chambers, 32 and 34, each supplied with steam. Lower chamber 32 is positioned under the band 20 and directs steam onto the underside of the band. Upper chamber 34 is positioned above the band with a source of steam 36 located centrally within the upper chamber. The upper chamber 34 is shown to be defined by walls on all sides except for an open bottom 38 which permits direct contact of the steam with the sheet and narrow gaps 40 and 42 between the sheet 26 and entrance wall 44 and exit wall 46. Typically, gap 40 will be from 10 to 12 millimeters in height and gap 42 will be from 8 to 10 millimeters in height.

Steam is permitted to exit the upper chamber 34 through gaps 40 and 42. The size of the gaps, determined by the height of walls 44 and 46 above the sheet, controls the rate of flow of steam through the gaps and, therefore, the quantity of steam which directly contacts a given area of the sheet and the rate of heat supplied to the sheet. Therefore, as the thickness of the sheet 26 increases, the gaps 40 and 42 narrow, thereby bringing more steam into direct contact with the sheet and increasing the rate at which heat is supplied to the sheet.

Following heating, the resulting sheet of meaty material is sliced, i.e., cut, into appropriately-sized pieces for a canned meat and gravy pet food product. Preferred sliced pieces will be dices of square or rectangular shape, or thin slices of from about 5 to about 6 millimeters in thickness. The preparation of the thin slices of uniform size and with clean cuts and a minimum of fines is especially difficult, and the process of the invention provides especially good results.

Where a wide sheet is formed, it is preferred to slit the sheet, such as with a plurality of disc-shaped cutters, shown at 48 in Figure 1, similar to rotary pizza cutters, along a plurality of lines parallel to the direction of sheet movement. In this case, as in the case where narrower strips of emulsion are initially formed, the strips are sliced transversely to the direction of movement such as by a high speed guillotine cutter as shown at 50 in Figure 1.

A gravy component is prepared for canning with the meat pieces. The gravy will typically comprise at least a thickener such as flour, regular and modified food starch, pregelatinized starch, vegetable or other gums, or the like, and water. It may also contain sucrose, corn syrup, salt, color, flavors, minor nutrients or the like. Preferably, a mixture of from 2 to 7% starch, from 2 to 7% sugar, and water is heated, as shown at kettle 52 in Figure 1, to provide a thickened gravy which when applied to the meaty pieces provides a high sheen to the pieces.

The meaty pieces and gravy are canned and retorted in conventional manner to provide a canned meat and gravy pet food which is visually appealing due to the cleanly-cut, resilient meaty pieces which are given a high sheen by the gravy which remains clear and free flowing without any significant visible fat or an excess of fines. The meaty pieces will typically comprise at least 45%, and preferably a major portion of the canned product, with the gravy forming a minor portion, by weight. Preferably, the product will comprise from 50 to 60% by weight of meaty pieces. The meaty pieces are preferably fed to the cans at filler 54 prior to adding the gravy at filler 56. Retorting, for example in retort 58, will be under conditions effective to preserve the canned product, say by steam retorting. Upon opening the cans, the meat and gravy product easily pours from the cans.

#### Best Mode for Carrying out the Invention

The following examples further illustrate and explain the invention by detailing the production, not only of a product having thinly sliced meaty pieces but also one having meaty pieces sliced into dices. Unless otherwise indicated, all parts and percentages are on a weight basis.

#### EXAMPLE 1

Blocks of frozen meat and meat by-products (beef, liver, lungs and spleens) are tempered overnight. The tempered meats are ground through an Autic grinder equipped with 0.48 cm. (3/16 inch) hole grind plate. These meats are mixed with dry and liquid ingredients in the proportion outlined in Table I. Mixing is performed in a Patterson twin-shafted mixer for 15 minutes. The blend is emulsified through a Karl Schnell

emulsifier equipped with dual cutting plates, the first plate having 3.0 mm holes and the second having 1.7 mm holes. The resulting fine emulsion is transferred to a Hutt DP formpress. The formpress produces a 9.3 mm thick x 280 mm wide emulsion sheet at the rate of 127 kg/hr (280 lb/hr). This sheet is passed through a steam tunnel, similar to that depicted in Figure 2, with a residence time of two minutes. Temperature of raw emulsion entering the steam tunnel is 15-20 °C (59-68 °F) and it is raised to 80-82.78 °C (176-181 °F) at the steam tunnel discharge. The cooked, firm sheet is sliced with the slitter knives spaced 25 mm apart.

The newly formed strips are guillotine cut about 5.5 mm long. The slice dimensions after guillotine cut are 24.5 mm x 10.7-12.4 mm x 5.5 mm. These slices are filled into cans with a Solbern filler. A gravy is prepared according to formula given in Table I and is heated in a jacketed kettle. The hot gravy is added to the slices via an FMC piston filler. The filled 87 mm x 43 mm cans are retorted in a still retort. The finished product has a very appetizing appearance and is very palatable to dogs.

TABLE I

Sliced Beef Dinner Formula

<u>Ingredient</u>	<u>Beef Slices (52%)</u>	<u>Gravy (48%)</u>
Water	1	90
Beef	30	-
Beef Lungs	20	-
Pork Liver	20	-
Beef Spleen	13	-
Soybean Flour, Defatted	7	-
Sugar	-	5
Powdered Blood Plasma	4.5	-
Modified Waxy Maize Starch	-	4
Animal Fat	2	-
Salt	1	0.5
Dicalcium Phosphate	1	-
Color	-	0.5
Vitamins, Minerals and Antioxidant	0.5	-
	<u>100.00</u>	<u>100.00</u>

EXAMPLE 2

The formula outlined in Table II is used to produce a canned dog food containing chicken-flavored dices in a shiny gravy. The meat emulsion is prepared using the procedure outlined in Example 1. The emulsion is extruded through a Hutt DP formpress equipped with a die block which has a plurality of rectangular openings of 8 mm x 8 mm cross-section. Emulsion strip-shaped sheets exit this die. The average gap between two adjacent strips is 5.4 mm. The emulsion strips are cooked in the steam tunnel for about one minute which results in a 185 °F product temperature at the tunnel exit. The cooked strips are guillotine cut to 12.5 mm length. The dice dimensions after guillotining are 12.5 mm long x 9.0 mm wide x 8.6 mm thick. These dices are canned along with 90.56 °C (195 °F) gravy (composition outlined in Table II) in 87 mm x 43 mm cans. The cans are retorted in a still retort. The resultant product has tan color chicken dices immersed in a light gravy. Kennel tests show the product to be very palatable.

TABLE II

Diced Chicken Formula		
Ingredient	Chicken Dices (52%)	Gravy (48%)
Water	1	90
Pork Liver	40	-
Chicken Parts	16	-
Whole Chicken	16	-
Beef Lungs	12	-
Soybean Flour, Defatted	6	-
Sugar	-	5
Powdered Blood Plasma	5	-
Modified Waxy Maize Starch	-	4
Animal Fat	1	-
Salt	1	0.5
Dicalcium Phosphate	1	-
Caramel Color, Liquid	-	0.5
Color, Vitamins, Minerals, and Antioxidant	1	-
	100.000	100.00

## Claims

1. A process of preparing a canned pet food comprising preparing a slurry by grinding a mixture comprising liver and other meat and meat by-products and incorporating therein a binder, subjecting the slurry to agitation and cutting sufficient to produce a meat emulsion, forming said meat emulsion, heating the formed emulsion, feeding thus formed meaty pieces into a can with a gravy, and closing and retorting the can, characterized in that liver is provided in an amount from 15% to 40% by weight of the meaty pieces, the binder includes at least 3% soybean flour and at least 2% dried blood plasma by weight of the meaty pieces, the meaty pieces have a total fat content of at least 2% and a total meat content of at least 75%, and the forming step comprises forming the meat emulsion into a sheet, the sheet being cut into discrete meaty pieces after being heated to an internal temperature of at least 76.67° C (170° F).
2. A process according to claim 1, characterized in that wherein the sheet is cut into slices by first slitting the sheet along a plurality of lines parallel to its direction of movement to produce a plurality of meaty strips; and then slicing the strips transversely to their long axes to produce thin meaty slices with a minimum of fines and broken or ragged pieces.
3. A process according to claim 1, characterized in that the sheet is heated from below by steam applied to the underside of a continuous metal band carrying said sheet and from above by a steam chamber positioned over the sheet; said steam chamber permitting flow of steam from a source centrally located within said steam chamber and directly over said sheet and out at least one gap between the sheet and the chamber such that if the thickness of said sheet increases, the velocity of the steam over said sheet also increases, thereby bringing more steam into contact with said sheet and increasing the heat supplied to the sheet.
4. A process according to claim 3, characterized in that a lower steam chamber is positioned under said band which directs steam onto the underside of said band.
5. A process according to any of claims 1 to 4, characterized in that said gravy is prepared by heating a mixture comprising thickener and water in amounts sufficient to provide, after retorting and cooling, a gravy which is free-flowing from the can and coats the meaty slices to provide a high sheen.

## Patentansprüche

1. Verfahren zur Herstellung von Haustierfutter in Dosen, umfassend die folgenden Schritte: ein Brei wird hergestellt durch Mahlen einer aus Leber und anderen Fleischprodukten sowie Fleischnebenprodukten bestehenden Mischung und Zugabe eines Bindemittels; der Brei wird solange gerührt und zerkleinert, bis eine Fleischemulsion entsteht; die Fleischemulsion wird geformt; die geformte Emulsion wird erhitzt; die so entstandenen fleischartigen Stücke werden mit Fleischsaft in eine Dose gefüllt; und die Dose wird geschlossen und versiegelt, dadurch gekennzeichnet, daß Leber in einer Menge von 15 bis 40 Gew.-% der fleischartigen Stücke enthalten ist, daß das Bindemittel in den fleischartigen Stücken mindestens 3 Gew.-% Sojabohnenmehl und mindestens 2 Gew.-% getrocknetes Blutplasma enthält, daß die fleischartigen Stücke einen Fettgehalt von insgesamt mindestens 2% und einen Fleischgehalt von insgesamt mindestens 75% besitzen, und daß bei dem Formungsschritt die Fleischemulsion zu einer Bahn geformt wird, wobei die Bahn in einzelne fleischartige Stücke geschnitten wird, nachdem sie auf eine Innentemperatur von mindestens 76,67 °C (170 °F) erhitzt wurde.
2. Verfahren nach Anspruch 1, dadurch gekennzeichnet, daß die Bahn in Scheiben geschnitten wird, indem die Bahn zunächst entlang einer Vielzahl von Linien, die parallel zu ihrer Bewegungsrichtung sind, durchgeschnitten wird, um eine Vielzahl von fleischartigen Streifen herzustellen; und die Streifen dann quer zu ihrer Längsachse zerschnitten werden, um mit einem Minimum an faserigen und ab- oder eingerissenen Stücken dünne Fleischscheiben herzustellen.
3. Verfahren nach Anspruch 1, dadurch gekennzeichnet, daß die Bahn von unten mit Dampf erhitzt wird, der auf die Unterseite eines durchgehenden Metallbandes gerichtet wird, das diese Bahn trägt, und von oben durch eine über der Bahn angeordnete Dampfkammer; wobei die Dampfkammer Dampf aus einer mittig in der Dampfkammer und direkt über der Bahn angeordneten Quelle und durch mindestens einen Spalt zwischen der Bahn und der Kammer strömen läßt, so daß mit zunehmender Dicke der Bahn die Geschwindigkeit des über die Bahn strömenden Dampfes ebenfalls zunimmt, so daß mehr Dampf mit der Bahn in Kontakt kommt und der Bahn mehr Wärme zugeführt wird.
4. Verfahren nach Anspruch 3, dadurch gekennzeichnet, daß eine untere Dampfkammer unter dem Band positioniert ist, die Dampf auf die Unterseite des Bandes richtet.
5. Verfahren nach einem der Ansprüche 1 bis 4, dadurch gekennzeichnet, daß der Fleischsaft hergestellt wird, indem eine Mischung erhitzt wird, die Verdickungsmittel und Wasser enthält in Mengen, die ausreichen, um nach dem Destillieren und Abkühlen einen Fleischsaft zu ergeben, der frei aus der Dose fließt und die Fleischscheiben überzieht, so daß diese stark glänzen.

## Revendications

1. Procédé de préparation d'un produit alimentaire pour animaux domestiques, mis en boîte, qui comprend la préparation d'une pâte par broyage d'un mélange comprenant du foie et d'autres viandes et sous-produits de viande et par incorporation d'un liant, le traitement de la pâte par une agitation et un hachage suffisant pour produire une émulsion de viande, le façonnage de ladite émulsion de viande, le chauffage de l'émulsion de viande façonnée, l'introduction des morceaux façonnés à base de viande dans une boîte avec une sauce, la fermeture et la stérilisation de la boîte, caractérisé en ce que le foie est introduit dans une proportion allant de 15 % à 40 % en masse par rapport aux morceaux à base de viande, en ce que le liant inclut au moins 3 % de farine de soja et au moins 2 % de plasma de sang séché par masse de morceaux à base de viande, en ce que les morceaux à base de viande ont un taux total de graisse d'au moins 2 % et un taux total en viande d'au moins 75 % et en ce que l'étape de façonnage comprend la transformation de l'émulsion de viande en une plaque, la plaque étant découpée en morceaux séparés à base de viande après avoir été chauffée à une température interne d'au moins 76,67 °C (170 °F).
2. Procédé selon la revendication 1, caractérisé en ce que la plaque est découpée en tranches par un premier découpage de la plaque le long d'une pluralité de lignes parallèles à sa direction de mouvement pour produire une pluralité de bandes à base de viande ; puis en ce que les bandes sont tronçonnées transversalement par rapport à leurs grands axes pour produire des tranches à base de viande avec un minimum de pertes et de morceaux abîmés ou irréguliers.

3. Procédé selon la revendication 1, caractérisé en ce que la plaque est chauffée par le dessous par de la vapeur appliquée au côté inférieur d'une bande métallique continue transportant ladite plaque et par le dessus par une chambre à vapeur située au dessus de la plaque ; ladite chambre à vapeur permettant la circulation de vapeur depuis une source située au centre de ladite chambre à vapeur et directement au-dessus de ladite couche et avec au moins un espace entre la plaque et la chambre de façon à ce que si l'épaisseur de ladite plaque augmente, la vitesse de la vapeur au-dessus de ladite plaque augmente aussi, une quantité plus importante de vapeur venant ainsi au contact de ladite plaque et augmentant la chaleur fournie à la plaque.
4. Procédé selon la revendication 3, caractérisé en ce qu'une chambre à vapeur inférieure est située sous ladite bande et dirige de la vapeur vers le côté inférieur de ladite bande.
5. Procédé selon une quelconque des revendications 1 à 4, caractérisé en ce que ladite sauce est préparée en chauffant un mélange comprenant un épaississant et de l'eau en proportions suffisantes pour donner, après stérilisation et refroidissement, une sauce qui coule facilement de la boîte et recouvre les tranches à base de viande pour donner un bel aspect luisant.

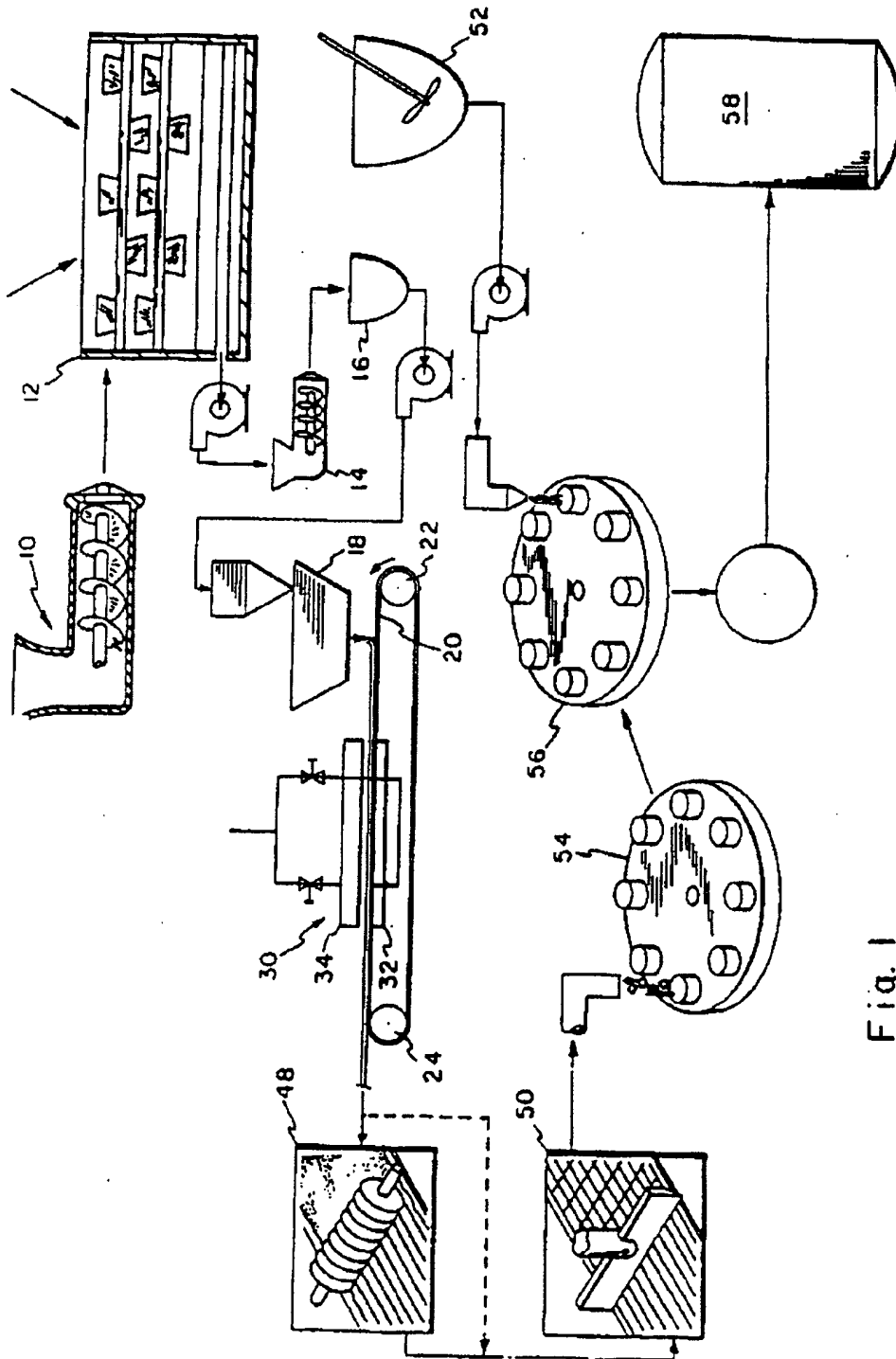


Fig. 1

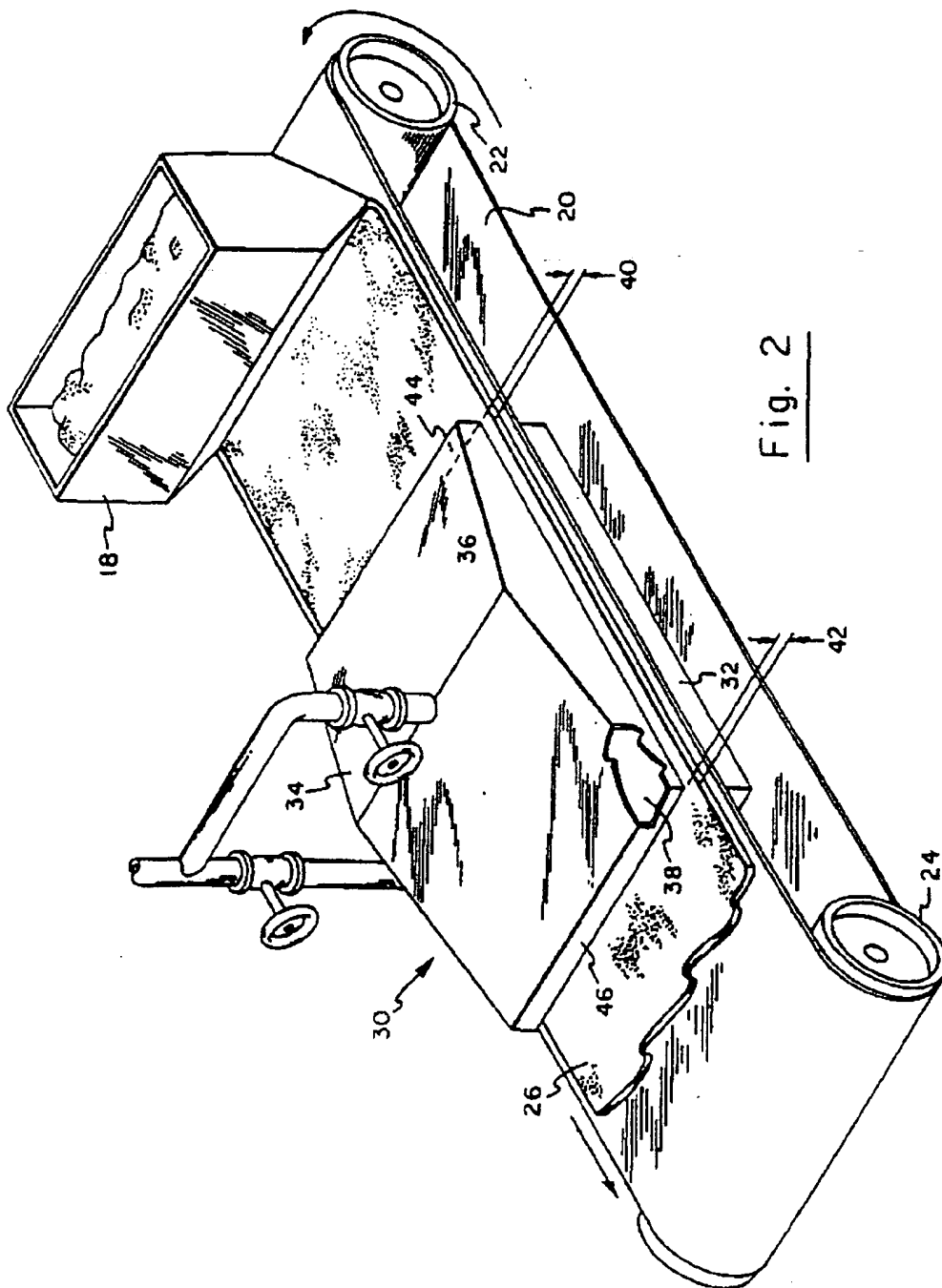


Fig. 2

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